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ABSTRACT

Out of a need to provide self-paced instructional units, a project was developed combining various delivery techniques in a unique package designed to increase instructor efficiency and to allow students to proceed with learning as quickly as they are individually able. Although the project is not yet in final form, field testing has been encouraging. Queuing was eliminated; students quickly divided into three distinct groupings and were able to proceed at their own pace; comparison of pre- and post-test data showed an average increase of 35% as a result of the program; overall performance of the class increased; and finally, several students completed their work three weeks ahead of schedule. Long-range plans include an in-depth research effort to discover whether there are any significant differences between this approach and the more traditional classroom/lab situation. (Author/VT)

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The Development of an Individualized Course in Basic Business Filing Rules and Procedures For Post Secondary Deaf Students Utilizing Computer Assisted Instruction Gregg Programmed Instruction and Classroom Teacher.

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James R. vonFeldt

August 1977

National Technical Institute For the Deaf
Rochester Institute of Technology
Rochester, New York

IR006015

Acknowledgements:

The original idea for the FILE program originated with Joseph R. Badamy, Assistant Professor at NTID. The fundamental work described here was developed and implemented through the assistance of the Computer Assisted Instruction department of the Curriculum Development and EvaluationDDivision of NTID. Dr. vonFeldt served as Curriculum Development Specialist and CAI strategy design for the project. Later development and expansion of the File program was done primarily by Joseph Badamy with the assistance of Ms Marsha Young from the CAI department. The current quality of the program, now titled RECORDS MANAGEMENT, (NBFIL), is due in no small part to refinements suggested by Ms Karen Conner, Assistant Professor of Business Technologies at the National Technical Institute For The Deaf.

More specific documentation on this program is available upon request to Dr. James R. vonFeldt, Coordinator of CAI at NTID.

Attempting to individualize a course is often at best a back-breaking task. The results, however, can be most gratifying. The development of a CMI program in business filing rules and procedures was no exception. Out of a need to provide self-paced instructional units there was born a CMI project which combined CAI, programmed instruction, a practice set and live instruction in a unique package designed to increase instructor efficiency (allowing more time for individual attention to those needing it) and to allow students to proceed with learning as quickly as they are individually capable of pursuing it. The Project was dubbed: FILE. Results of the field test of the entire project were gratifying. Queing was eliminated; students quickly divided into three distinct groupings and were able to proceed at their own pace; comparison of pre- and post-test data showed an average increase of 35% as a result of the program; overall performance of the class was well above the average attained when the instructor paced everyone at the same general tempo; finally, several students completed their work three weeks ahead of schedule, an occurrence which could not occur under the original and traditional approach. (For course objectives, text, instructors, etc. see Attachment A.)

In the course in business filing, lab work consisted of the "Gregg Quick Filing Practice Set" (Gregg/McGraw Hill). In this set, students studied two filing rules and examples, arranged ten cards or letters in proper order according to the rules, and filled in an answer sheet which was then checked for accuracy by the instructor. (See Attachment B.) When errors were found, the instructor discussed them with the students and, in effect, provided individual tutoring.

When several students completed a unit at the same time (a frequent occurrence) they would find themselves queing for instructor attention. Some, frustrated by the long wait would return to their work and complete the next unit. Errors made in the first unit were compounded in the second and were thereby reinforced. This ultimately added to the burden of the student (who had to "un-learn" the errors, then learn the correct procedure) and the instructor (who had to show the student why the work was incorrect and teach the proper application of the rules). A similar problem occurred whenever students continued to work on their own at home.

Analysis of the overall problem revealed that there were three distinct levels of students:

1. Students who had little or no difficulty with most units and could easily move through the entire sequence, if allowed (15%);
2. Students who required a minimum amount of help in some areas and could also move through the program, generally on their own (35%);
3. Students who required a great deal of individual attention before they were able to move through the program generally as well as level 2 students (50%).

Students at levels 1 and 2 were often required to wait until the instructor was free to correct their work before they moved ahead. Level 3 students, who needed the most assistance, found they had to wait for help until the instructor completed correcting the work of students at levels 1 and 2. Since there was a limit on the time available to both students and instructor, level 3 students did not receive the quantity and, at times, the quality of instructor assistance they needed.

It was thought that a computer program designed to check answers would eliminate much of the queing which developed from the existing approach. However, in further analyizing the situation it was decided that it would be possible to meet much of the minor remediation needs of level 2 students by incorporating a second program designed to give students a "hint" as to the correct answer whenever they had an incorrect response. This type of feedback would promote a reduction in dependency on the instructor.

To accomplish this, two stages were developed. The first was a "pre-test" program which required the students to enter the responses from their answer sheet. The format for this part of the program was similar in appearance to the answer sheet which was part of the Gregg package. A simple criterion, based on the number of correct responses, was used to determine if a student would continue to the next unit or branch to the second stage. To continue, a student needed a minimum score of 9 out of 10. This allowed for one typographic error; any filing error would result in at least two incorrect responses.

The second stage was in the form of a visual simulation of a file card (hereafter known as the "card graphic"). A student going through this "simulation" would be asked for the number on each card and, as the correct response was given, would receive a double reinforcement: a) a congratulatory message, and b) a display of the correctly filed name appearing within the "card graphic". (See Attachment C).

In this stage, 100% accuracy was considered essential for exiting criterion. However, if students made three erroneous responses for the same item, they were referred to the instructor.

In theory, and on paper, the idea appeared sound. But, it was decided by the instructor and the instructional programmer that a two unit pilot project would be the best way to evaluate the idea prior to a full commitment of resources to the entire Gregg program.

The pilot was developed to provide answers for the following questions:

1. Can the CMI/CAI capacity of the NTID 1500 System increase the instructor's efficiency in administering the Gregg program?
2. What are the students' attitudes toward CAI as a result of experiencing CMI/CAI with the Gregg program?
3. What is the effect of using CMI/CAI in terms of student effectiveness and efficiency in attaining the skills provided by the Gregg program?
4. Is it feasible to develop the entire Gregg program in this mode of instruction?

Units 1 and 2 of the Gregg program were prepared for the pilot evaluation and data was collected during the pilot by both the instructor and the instructional program. Activities of the pilot were as follows:

1. The students worked in the CAI lab (terminal room) and were given instructions on the use of the Gregg program prior to actual exposure to the pilot program. (Students retained the Gregg program throughout the course).
2. Upon completing the first task (unit 1 of the Gregg program) the students went to a CAI terminal to use the CMI/CAI program.
3. Students proceded through the CMI/CAI pilot on one of two levels:
   a) Pre-test level
   b) Simulation (slight remediation) level using the "card graphic" and feedback techniques cited.

Data gathered from this pilot program supported the following conclusions:

1. The instructor's efficiency in administering the Gregg program was increased;
2. The attitudes of NTID students toward CMI/CAI in conjunction with the Gregg program were positive;
3. The effectiveness of the Gregg program was maintained in terms of concepts learned and retained by the students;
4. Greater efficiencies resulted for half of the pilot group: Students at levels 1 and 2 moved through the lessons at a good tempo and with minimum instructor assistance; slower students (level 3) received a greater amount of individual help.

Because of the success of the pilot, the entire Gregg program was developed in this mode and a field test was initiated. During this phase, the instructors involved in the field test (Joseph R. Badamy, principal investigator, and Karen K. Conner) found themselves answering the same kinds of questions from students referred by the computer after they incorrectly responded three times for the same item. Yet, despite the benefits of the program, slower students (level 3) still were not receiving enough individual assistance. Upon discussing the situation, it appeared that much of this could be corrected by teaching rules, together with some examples and practice exercises, before the student actually engaged in the pertinent sections of the Gregg program. It was decided, therefore, to build an instructional segment for each unit of the Gregg program, based upon those questions most frequently asked by students. This segment would then be incorporated with the existing two stage program.

It was also the observation of the instructors that, due to the language level of most of the NTID students enrolled in the course, the section of the Gregg program which dealt with correspondence filing could be better taught by an experienced instructor capable of shifting language levels based on the needs of the group addressed. Therefore, the course flow was changed from that presented in the Gregg program (see Attachment D); students would now complete all rules on card filing prior to studying correspondence filing procedures. Further, because it was anticipated that the revised program would more readily enable the different levels to finish at different times, it was decided that the principal investigator (the author) would supervise those portions of the program dealing with card filing while the other instructor (K. Conner) would work with the various groups on correspondence filing, when and as they exited the first part of the program.

It should be noted that the first two stages were coded directly into Coursewriter II, primarily by specially trained coders. The instructional programmer had trained the author in some of the techniques necessary for these two stages: flow charting, scripting, framing and elementary coding (Attachment E) but there was insufficient time for adequate skills to be developed and utilized as far as actual coding was concerned. Stage three, the instructional segment, however, was approached on a different basis.

Through a specially designed program (project skill) a group of instructors were trained in the basics of course development, objective writing, flowcharting, scripting and, finally, coding a sample lesson using the language known as TACL. Since the author had prior experiences with CAI and the problems which develop when one must interface with coders, instructional programmers, etc., the author was quick to see the

advantages of being able to code directly. Control over input, debugging and testing was in the hands of the author and changes could be made at the discretion of the author, based on experience and observations.

The format for the on-line instructional segment would be to present two rules (one at a time), each with examples and practice exercises; upon completing the rules and practice, a short quiz would be given on the two rules. Those students who had a perfect score were referred to the appropriate exercise in the Gregg text; an imperfect score resulted in looping back to the appropriate rule. Then the students (off-line) would review the rules, apply them to actual "hands on" work and bring their work to the terminal where the sequence of filing was verified (the "pre-test" previously described). If their work was correct, the students would be given the next instructional segment and so it would continue. If, on the other hand, the "pre-test" was not satisfactory, the students would go through the "simulation" stage, then to the next instructional segment (See Attachment F).

This version of "FILE" was field tested in the Fall Quarter, 1974. Experience with the program indicated a need for some minor revision and final debugging. As a result, version III (being developed) will be field tested in 1975 (probably Fall Quarter) and additional data collected. Long-range plans include an in-depth research effort to discover whether there are any significant differences between the CMI/CAI/PI/Instructor approach and the more traditional classroom/lab situation. Initial reactions of students and data collected to date indicate differences; time is required to ascertain the importance of these.

SP3311:jo

(r/1/21/75)

GLOSSARY OF PERTINENT TERMS

Branch - an alternate path through a course or program which depends on student response to an evaluation item. (This is more accurately known as a conditional branch.)

C A I - Computer Assisted Instruction - The computer teaches specific items; CAI is one of several learning activities such as programmed instruction, film, practice sets, etc.; it is a medium used to enhance learning.

CMI - Computer Managed Instruction - The computer is used to keep track of student progress and to prescribe various learning activities based upon analysis of test criteria.

Coding - writing instructions in a computer language so the program will operate as desired (See Attachment E).

Coursewriter II - An educationally oriented language developed by IBM specifically for use on the 1500 system.

Debug - to "troubleshoot" or find errors in the program; errors can be program errors (due to poor logic or coding) or presentation errors (due to instructor misjudgment).

Feedback - information which is given to the student concerning the correctness of a response (See Attachment C).

1500 System - an IBM educationally oriented system which utilizes the 1130 (IBM) computer.

FILE - a CMI program in basic business filing rules and procedures which utilizes CAI, PI and live instruction to meet the objectives of the course.

Flowchart - a diagram which shows how a student will move through a course or program.

Framing - laying out the program script on a special grid (see Attachment E).

Gregg Program - "Gregg Quick Filing Practice," Kahn and Stewart, Gregg/McGraw-Hill, 1965.

Instructional Programmer - an expert in the use of CMI/CAI for educational purposes; the person who does the actual programming of the computer.

Off-line - student is not using the computer for the part of the program.

On-line - student is using the computer for that part of the program.

P I - Programmed Instruction - A step by step educational package which teaches a skill or concept, gives the student an opportunity to use that skill or concept and provides feedback concerning the correct response.

Project SKILL - the training program at NTID developed by James von Feldt to sensitize staff members to the capabilities and limitations of CMI/CAI, to train professional staff in the analysis, planning and development of objectives and instructional packages, and to teach staff how to write CAI programs using TACL.

Scripting - Writing and drawing the information which is to be presented to the student (See Attachment E).

TACL - Teacher Authored Coursewriting Language - A simplified computer language developed at Penn State University specifically for use by teachers in the writing of instructional programs on a 1500 system.

T121/jb
(r/1/21/75)

ATTACHMENT A

Course Description

A study of various procedures utilized in filing, sorting and retrieving business records according to specific rules. Through practical exercises the student learns the different considerations which affect Records Management.

Course Objectives

Upon completion of the course, the student will be able to:

1. Identify the basic methods of organizing business records;
2. Identify the basic vocabulary used in Records Management;
3. Use standard alphabetic indexing rules to file cards and correspondence;
4. File correspondence by subject.

Text Used

Gregg Quick Filing Practice; Kahn, Stewart, Yerian; Gregg/McGraw-Hill, 1965.

Instructors

Joseph R. Badamy (Principal Project Investigator)

Karen K. Conner

CAI Assistance

James von Feldt (Sr. Instructional Programmer)

Marsha Young (Instructional Programmer)

Steven Mershon (CAI Proctor)

SP3319:jo
(r/1/21/75)

STUDENT'S TEXT-GUIDE

GREGG QUICK FILING PRACTICE

GILBERT KAHN, Ed
Chairman, Business Education Departm

EXERCISE 1

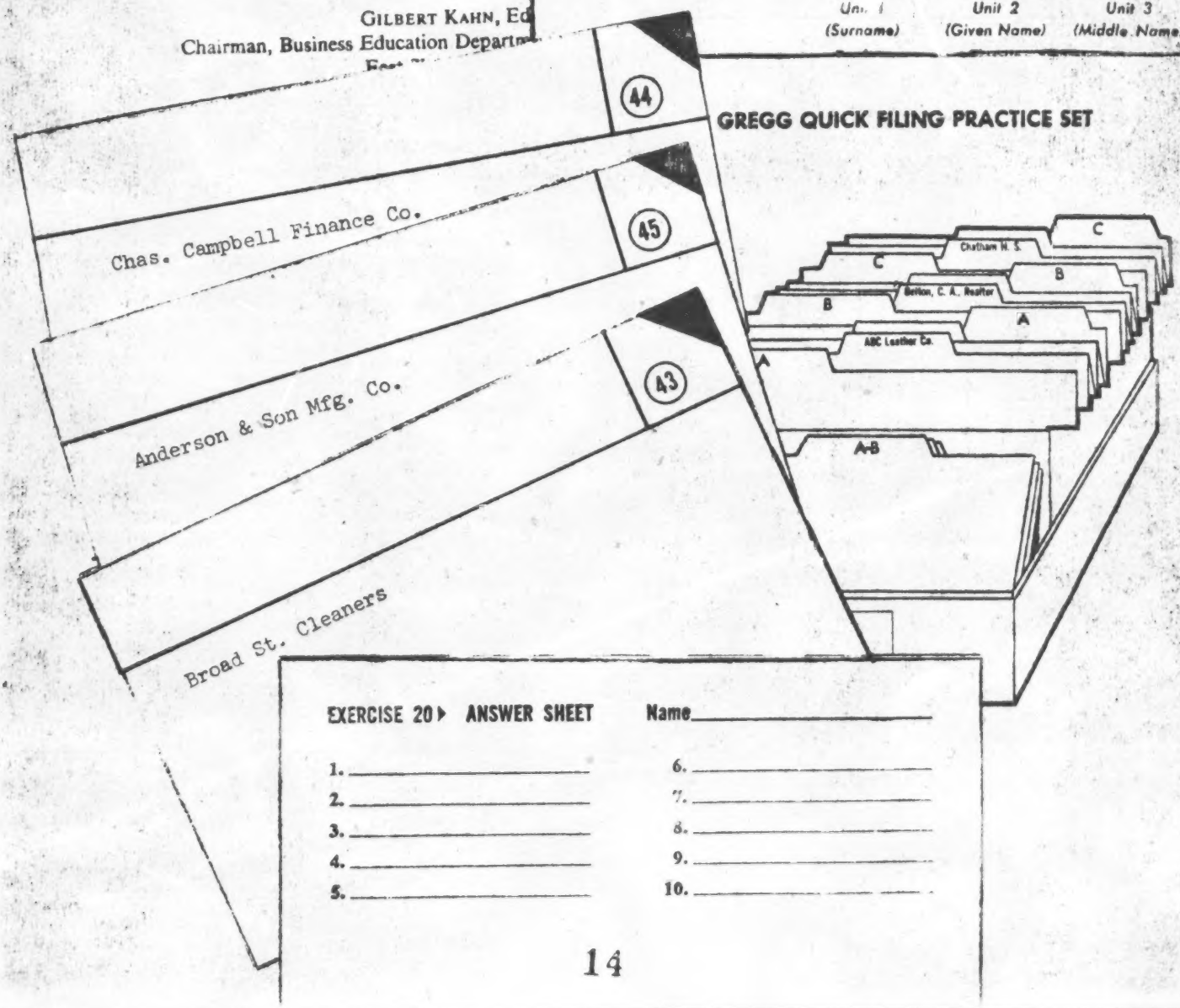
FIRST, LEARN THESE INDEXING RULES

Rule 1: Individual Names. The names of individuals are transposed and alphabetized in this order: surname (last name), first; given name (first name), second; and middle name, if any, third. Examples:

	Correct Indexing Arrangement		
Name	*Surname*	*Given Name*	*Middle Name*
Robert Boswell	Boswell,	Robert	
Martha Jean Camper	Camper,	Martha	Jean

Rule 2: Alphabetic Order. Names are alphabetized by comparing the *first unit* in each name, letter by letter. The *second units* are considered only when the first units are identical. The *third units* are considered only when both the first and second units are identical, and so on. Study these examples:

	Correct Indexing Arrangement		
	Unit 1 (Surname)	*Unit 2 (Given Name)*	*Unit 3 (Middle Name)*

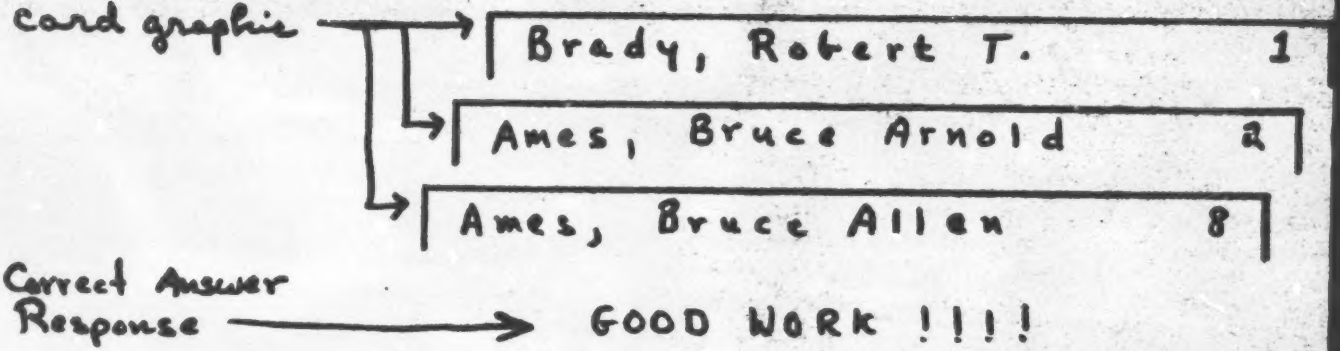


EXERCISE 20 ▸ ANSWER SHEET Name_____

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Label "Simulation"

"Simulation"

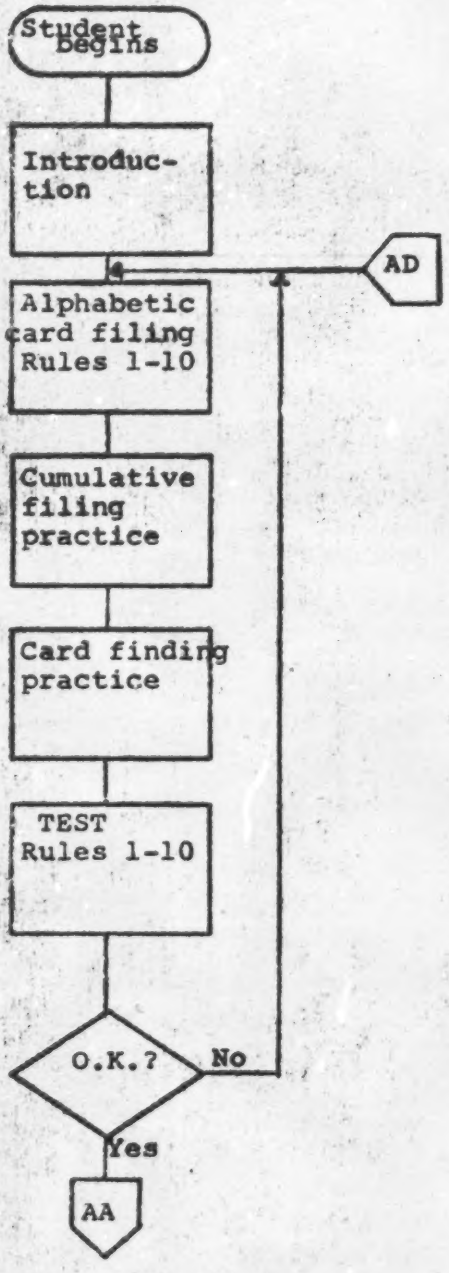


ATTACHMENT D

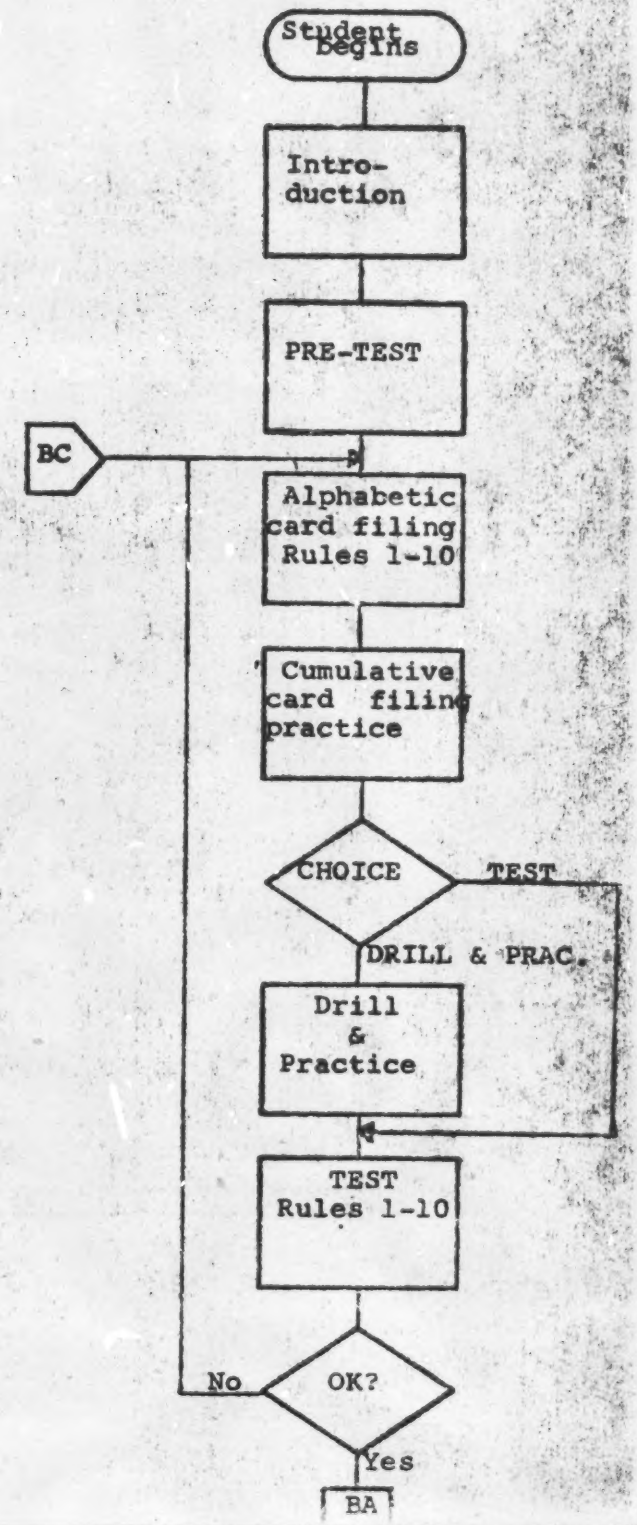
Comparative Flowcharts

Gregg vs. NTID

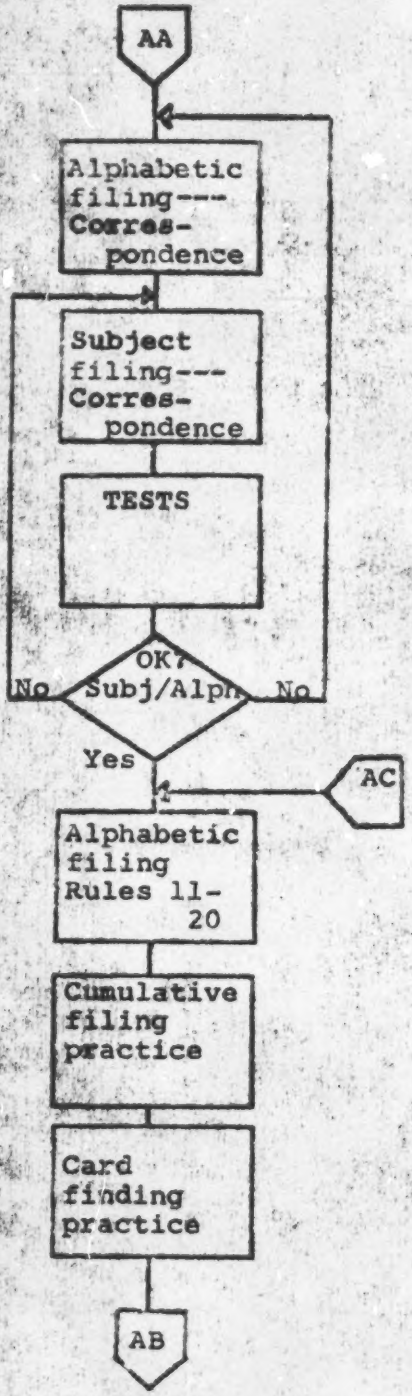
Gregg



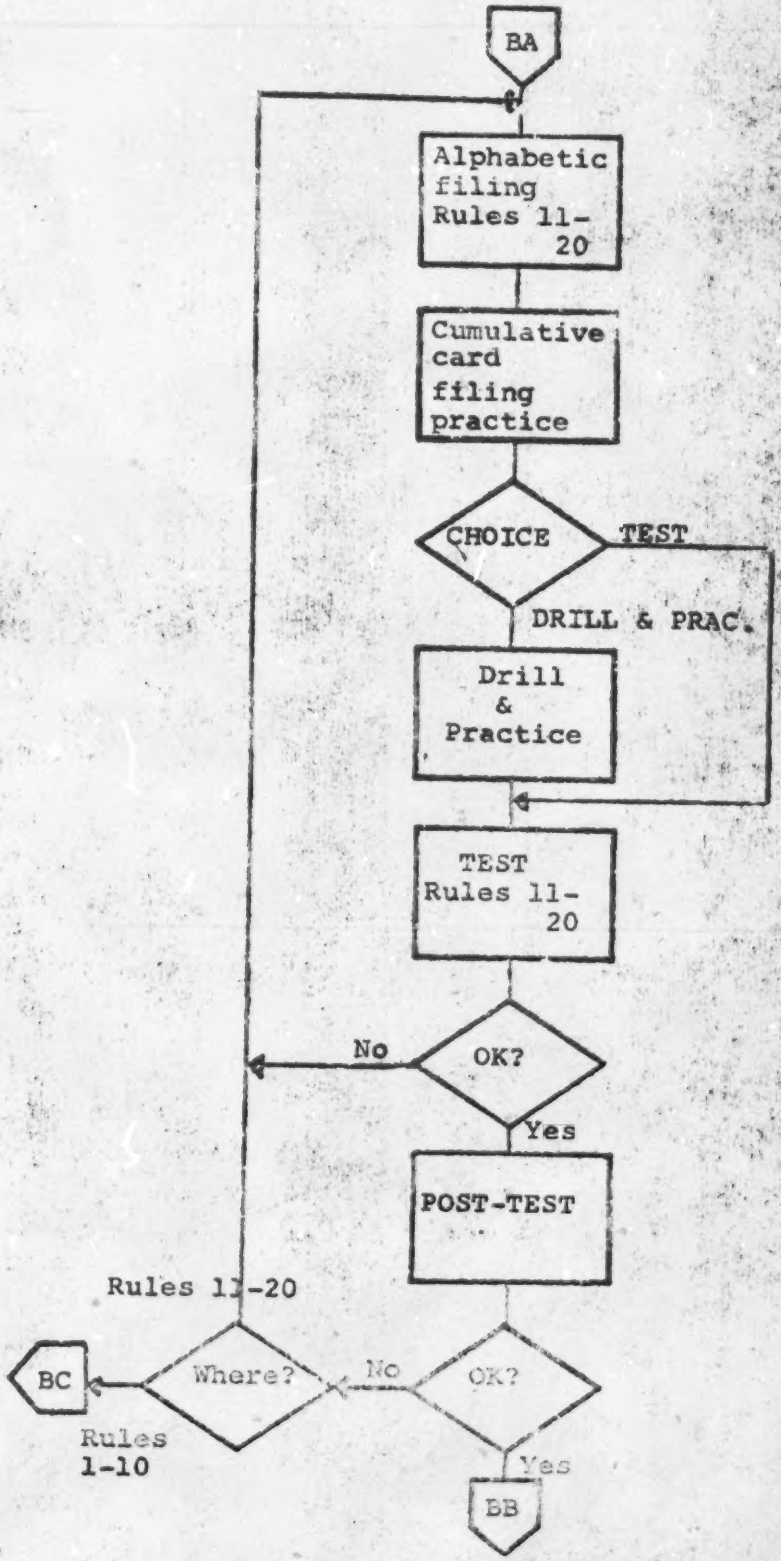
NTID



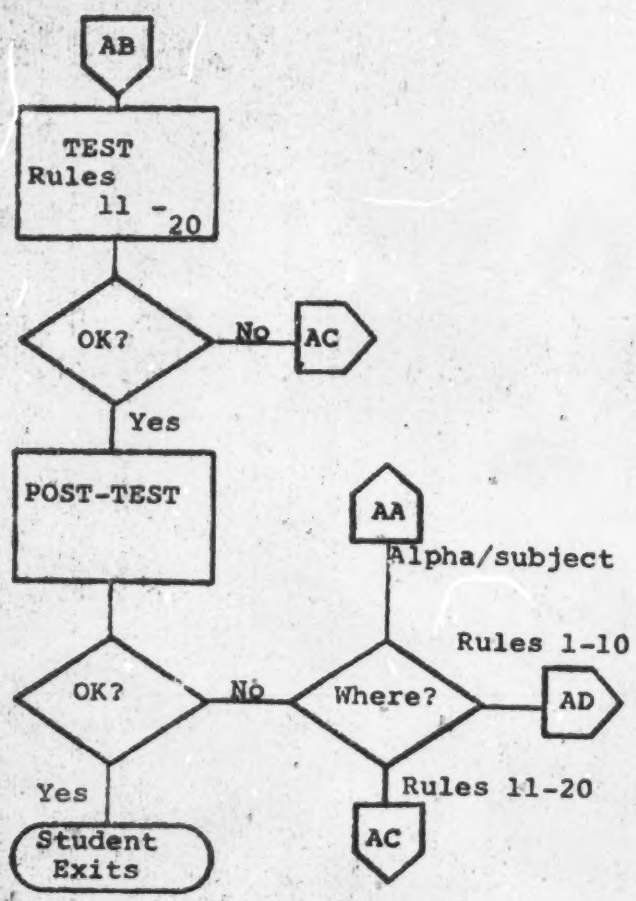
Gregg


AA
Alphabetic filing--- Corres- pondence
Subject filing--- Corres- pondence
TESTS
OK? Subj/Alph
No
No
Yes
AC
Alphabetic filing Rules 11- 20
Cumulative filing practice
Card finding practice
AB

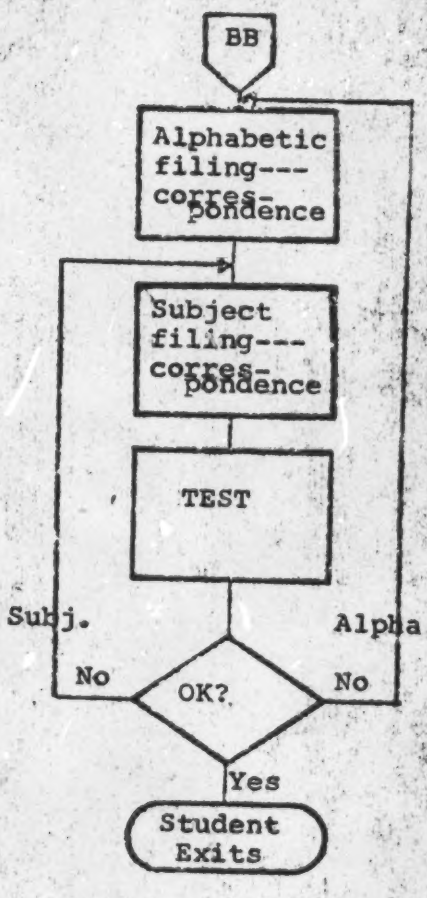
NTID


BA
Alphabetic filing Rules 11- 20
Cumulative card filing practice
CHOICE
TEST
DRILL & PRAC.
Drill & Practice
TEST Rules 11- 20
No
OK?
Yes
POST-TEST
Rules 11-20
BC
Where?
No
OK?
Rules 1-10
Yes
BB

Gregg


AB
TEST
Rules
11 - 20
OK?
No
AC
Yes
POST-TEST
AA
Alpha/subject
Rules 1-10
OK?
No
Where?
AD
Yes
Rules 11-20
AC
Student
Exits

NTID


BB
Alphabetic
filing---
corres-
pondence
Subject
filing---
corres-
pondence
TEST
Subj.
Alpha
No
OK?
No
Yes
Student
Exits

Rule 2 (continued)

Now it is your turn!!

1. John Adams

2. James Adams

which name is filed first?

If student answers 2, give response 3; if 1, give # 4; if other, give missed response, #1.

ATTACHMENT E-1
"Scripting"

"Coding"

frame
pause 3
Skip 10
Skip 14
pause 3
Keyboard
Skip 22
if(2) go to R-3
if(1) go to R-4
Un
go to UN-1

Now it is your turn!!

1. John Adams
2. James Adams

Which name is filed first??? □

"Framing"

ATTACHMENT F

Course Flow -- FILE